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UNITED STATES DEPARTMENT OF AGRICULTURE.
BUREAU OF ENTOMOLOGY.
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FOREST ENTOMOLOGY.

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Brief I. ON THE DYING OAK TREES ON LONG ISLAND, NEW YORK.

CAUSE.

During the past three or four years, tens of thousands of oak trees have died on Long Island and investigations have shown that this has been due largely, but not entirely, to a combination of attack by defoliating caterpillars and a bark boring grub.

The defoliators consist of larvae or caterpillars of moths known as canker worms, tent caterpillars, etc., which, during the past few years have been exceedingly destructive to the foliage of the oak and many other kinds of trees on Long Island.

It has been determined that oak trees defoliated by these insects will recover and put out new leaves if the bark on the branches and trunks of the defoliated trees is not attacked by the two-lined chestnut borer. Therefore, while the caterpillars are as a rule the primary cause of a weakened vitality of the trees, the borer is the cause of the final death of the trees and when in large numbers can and does make the primary attack on healthy trees and kills them.

Character, Habits and Seasonal History of the Two-Lined Chestnut Borer.

The adult of the two-lined chestnut borer (Agrilus bilineatus) is an elongate, slender, blue black beetle from 6 mm. to 10 mm. in length with a faint golden yellow stripe extending the full length of each wing cover. The common name is based on its discovery as a serious enemy of the chestnut and the technical name on the two stripes or lines on its back.

The larva is a long, slender, whitish worm-like grub, 15 to 24 mm. long, with a small flattened head-like thorax and just back of the true head with two pincer-like spines on the tail end. The pupa is about the same size and form of the beetle with the forming legs and wings encased in the pupal skin.

The winter is passed in the larval stage usually in the pupal cell in the outer bark of trees infested by it the preceding summer. In April and May before the buds on the oak trees have opened, the larvae begin to transform to pupae. Late in May and early June after the oak leaves have opened and the first ones are full grown, the beetles begin to emerge and continue to come out until in July. The adults feed for a time on the leaves before going to other trees to deposit their eggs. Eggs are deposited in the crevices of the bark of weakened or healthy trees early in June or about the time all of the leaves are full grown on the oaks and the buds are forming on the new twigs. The eggs soon hatch and the minute young larvae bore through the inner layer of bark to the outer layer of wood. As they feed and grow, they extend their narrow, very irregular, winding mines in all directions through the inner layers of bark and outer layer of wood until they have reached about their full size when they mine outward through the thick inner bark and form their pupal cells in the outer bark in which they pass the winter in a folded position. In small thin barked trees and branches of large trees they often mine into the outer wood to construct their pupal cells.

The two-lined chestnut borer appears to occur throughout the eastern half of the United States wherever the white oak or chestnut are found in natural growth. In 1893 the writer found a great many dead and dying oaks in Madison, Wisconsin, which were infested by this insect and since that time he has observed its work in many widely separated localities in the East. It has been especially destructive to the white oak and red oak in the area in New England in which the trees have been severely and frequently defoliated by the Gipsy, browntail and other caterpillars. On Long Island, it is known to have been more or less destructive to the trees since 1912 but of course has occurred there for a very long time.

While the chestnut trees killed by the blight do not offer the best conditions for the healthy development of the beetles the enormous number of trees that have died on the Island during recent years have doubtless contributed greatly to its multiplication and, as the chestnut diminished and the caterpillars defoliated the oaks, even better conditions have been provided for its multiplication in the oaks until it is no longer dependent on weakened trees for its successful attack.

The trees are killed by the girdling effect of the winding, overlapping and crossing of the larval mines through the inner layers of bark and outer layer of wood of a portion or the entire trunk. Thus the real vital part of the tree (the cambium) is killed and the movement of the life supporting sap is diminished or stopped and the death of the entire tree soon follows.

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